

C l a i m s :

1. Covering panel(s) for floors, walls and ceilings, formed preferably of wood, wood material, MDF, HDF, plastic material, recycled plastics, chips with artificial resin or bonded chips (particle board), the covering panels comprising a groove (12) along at least one edge or front surface (17) and/or a tongue (6) along at least one different edge or front surface (17),
 - panels (1, 2) to be joined together being interconnectable by inserting the tongue (6) into the groove (12) in the course of a displacement which substantially takes place in the panel plane, and
 - a bead or web (8) of an adhesive and/or of plastic material being applied or bonded, particularly at the factory, to at least one tongue surface (7),
 characterised in that
 - that a recess (3) is formed in the tongue surface (7) and receives in part said bead or web (8) of an adhesive and/or of plastic material, and
 - that a detent recess (5), delimited by a detent surface (4), is formed in that inner wall surface (15) of the groove which faces the tongue surface (7), into which detent recess (5) the bead or web (8) projects, when the tongue (6) is inserted into the groove (12), or by which detent recess (5) that portion (10) of the bead (8), which projects from the recess (3), is encompassed or received,
 - so that the bead (8) and the detent surface (4), after insertion of the tongue (6) into the groove (12) may be interlocked and/or interconnected or, in joined condition of two adjacent panels (1, 2), are interlocked and/or interconnected.
2. Panel(s) according to claim 1, characterised in that the groove (12) and the tongue (6) are each formed on a longitudinal side and on a transverse side of a panel (1, 2) in or on a front surface (17) thereof.
3. Panel(s) according to claim 1 or 2, characterised in that
 - that the thickness of the tongue (6) decreases towards the free end, wherein at least one tongue surface (7) is inclined relative to the surface of the panels (1, 2) and
 - that the wall surface(s) (15) of the groove (12) extend under the same angle as the associated or engaging tongue surface(s) (7).
4. Panel(s) according to any of claims 1 to 3, characterised in that

- the tongue (6) and the groove (12) may be interconnected, at least over part of the surfaces (7, 15) facing each other, in a positive way or with a snug fit and/or
 - that at least that area of the tongue (6), which is situated before the bead or web (8) towards the free end of the tongue (6), may be positively inserted into the groove (12) or with a snug fit.
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5. Panel(s) according to any of claims 1 to 4, characterised in that the tongue (6) and/or the groove (12) and/or the bead or web (8) and/or the detent recess (5) extend over the entire length of the respective lateral surface (17), or that the groove (12) and/or the tongue (6) and/or the bead (8) and/or the detent recess (5) extend in the form of successive, spaced segments or bead segments or recesses along the lateral surface (17).
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6. Panel(s) according to any of claims 1 to 5, characterised in that part of the bead or web (8) is countersunk in the recess (3).
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7. Panel(s) according to any of claims 1 to 6, characterised in that the adhesive of the bead or web (8) is water-soluble or can be partially dissolved and/or activated upon contact with or supply of water and/or moisture, and/or is formed by a water-soluble glue, e.g. white glue, and/or by a pressure adhesive or an adhesive, which develops an adhesive action when pressure is applied or is a pressure-activated adhesive and/or is formed by a quick-setting or a mounting glue based on polyvinyl acetate and/or by a commercial wood glue, e.g. based on starch and/or protein.
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8. Panel(s) according to any of claims 1 to 7, characterised in that the adhesive of the bead or web (8) has such a hardness or tenacity or viscosity, that it stands insertion of the tongue (6) into the groove (12) or widening of the groove (12) during insertion of the tongue (6) and sliding of the groove leg over it, without a substantial remaining change of shape, and that it acts as a locking element against escaping of the tongue (6) from the groove (12) after insertion of the tongue (6), optionally as long up to the moment where an adhesive effect occurs.
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9. Panel(s) according to any of claims 1 to 8, characterised in that
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- the legs (13, 14) of the groove (12) have an equal length and/or
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- that that leg (14) of the groove (12), which is at the back of the panel (1, 2), is insignificantly shorter than that leg (13), which is near the front surface of the panel (1, 2) and/or
 - that at least one leg (13, 14) of the groove (12), preferably the lower leg (14), may elastically be widened or may be elastically bent up, when the tongue (6) is inserted.
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10. Panel(s) according to any of claims 1 to 9, characterised in
- that the groove (12) and the tongue (6) are formed of the material of the panel (1, 2) or are milled out of it, or
 - that the tongue (6) is integrally formed of the material of the panel (1, 2).
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11. Panel(s) according to any of claims 1 to 10, characterised in that in the region of the upper surfaces or surfaces of use (18) of two interconnected panels (1, 2) the areas of the front surfaces engage each other and that, optionally, a gap (25) is formed in the region of the back (24) of the interconnected panels (1, 2) between the front surfaces (17).
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12. Panel(s) according to any of claims 1 to 11, characterised in that the portion (10) of the bead or web (8), which projects from the recess (3), and/or the detent recess (5) comprise a rounded contour in cross-section, particularly a lens-shaped, half-elliptic or circular contour.
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13. Panel(s) according to any of claims 1 to 12, characterised in that the projecting portion (10) of the bead or web (8) acts as a detent or locking element and/or as an element, which develops an adhesive effect.
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14. Panel(s) according to any of claims 1 to 13, characterised in that the adhesive of an applied bead or web (8) is deformable, particularly under the action of water and/or moisture and/or continuous pressure, and optionally adapts itself to the cross-sectional shape of the detent recess (5), particularly while simultaneously developing its adhesive action, or fills the free space of this detent recess (5) so far as an adhesive mass is in excess.
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15. Panel(s) according to any of claims 1 to 14, characterised in that the bead or web (8) firmly adheres in the recess (3).
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16. Panel(s) according to any of claims 1 to 15, characterised in that the bead (8), in locked or latched position of the groove (12) and the tongue (6), engages the detent surface (4) and optionally the groove surface (15), particularly in a position where it engages one of these surfaces in pressure biasing manner.
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17. Panel(s) according to any of claims 1 to 16, characterised in that the adhesive bead or web (8) comprises an adhesive-latent adhesive, preferably a polymer adhesive which can be emulsified in water, the adhesive being able to be converted into a condition ready-for cementing or of adhesiveness by moistening with water.
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18. Panel(s) according to any of claims 1 to 25, characterised in that the plastic material or the adhesive material of the adhesive bead or web (8), which is able to be (re)activated by means of water or moisture, is applied with a substantially uniform layer thickness of 0.5 to 0.9 mm, particularly of 0.6 to 0.8 mm, with thickness tolerances in the range of ± 0.05 to 0.1 mm.
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19. Panel(s) according to any of claims 1 to 18, characterised in that the leg (3) of the groove (12) near the upper surface is made stronger or thicker and/or so as to be bent in a less elastic manner than the lower leg (4) and/or that the bead (8) is only formed on the downwards directed tongue surface (7), while the detent recess (5) is formed only in the wall surface of the lower leg (4) of the groove (12).
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20. Panel(s) according to any of claims 1 to 19, characterised in that the bead (8) and the detent surface (4) of the detent recess (5) grip behind one another.
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21. Panel(s) according to any of claims 1 to 20, characterised in that the bead (8), in locked position of the groove (12) and the tongue (6), is under a pressure or force bias by at least one groove leg (13, 14), which has been widened open when inserting the tongue (6) into the groove (12).
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22. Panel(s) according to any of claims 1 to 21, characterised in that the bead (8), at least in segments, extends parallel to and along the edges of the front surface (17) or in longitudinal direction of the panel (1, 2).
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23. Panel(s) according to any of claims 1 to 22, characterised in that the recess (3) in the tongue (6) has a triangular cross-section, the area of the inner triangle edge being optionally rounded.

24. Panel(s) according to any of claims 1 to 23, characterised in that the depth of the recess (3) amounts to 30 to 55%, preferably 36 to 48%, of the total thickness or height of the bead (8).
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25. Panel(s) according to any of claims 1 to 24, characterised in that the cross-section of that portion of the bead (8), which projects from the recess (3), is rounded in a circular or elliptic or lens-shaped fashion.
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26. Panel(s) according to any of claims 1 to 25, characterised in that the recess (3) is formed in a region of the tongue (6) which stands back from the tongue surface (7) in the direction to the front surface of the panel (1, 2) or forms a standing-back region of the tongue surface (7).
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27. Panel(s) according to any of claims 1 to 26, characterised in that the detent surface (4) is formed by or results from a prolongation of the inner wall surface of the groove or joins to it, and is inclined to the surface of the panel (1, 2) under an angle of 95 to 105°, preferably of 97 to 103°, and in particular is perpendicular to the surface.
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28. Panel(s) according to any of claims 1 to 27, characterised in that the transition from the inner wall surface (15) of the groove, which delimits or forms the detent recess (5), to the detent surface (4) is rounded.
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29. Panel(s) according to any of claims 1 to 28, characterised in that, in latched position of the groove (12) and the tongue (6), a gap (21), particularly a meniscal one, is formed between the bead (8) and the rounded transition (11).
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30. Panel(s) according to any of claims 1 to 29, characterised in that that region (32) of the bead (8), which is next to the front surface (17) of the panel (1, 2) comprising the tongue (6), engages the detent surface (4).
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31. Panel(s) according to any of claims 1 to 30, characterised in that the terminal region (22) of the recess (3) is situated opposite the detent surface (4), which preferably is formed in the shape of a delimiting wall that has a triangular cross-section.
32. Panel(s) according to any of claims 1 to 31, characterised in that in the region of the front surfaces (17) above the groove (12) near the upper surface and/or of the tongue

(6) a stop (33) for delimiting the insertion of the tongue (6) into the groove (12) at least one spacer (23) is arranged which determines the distance of the opposite front surfaces (17) of the panels (1, 2) to be interconnected.

- 5 33. Panel(s) according to any of claims 1 to 32, characterised in that that portion of the groove surface (15), which extends over the recess (3), when the groove (12) and the tongue (6) are latched, engages the bead (8).
- 10 34. Panel(s) according to any of claims 1 to 33, characterised in that in the transition area from the inner wall surface (15) of the groove, where the detent recess is formed, to the front surface of this groove leg (13) is rounded.
- 15 35. Panel(s) according to any of claims 1 to 34, characterised in that the detent recess (5) and the recess (3) and the bead (8) extend at least along a portion, parallel to the respective front surface or side edge or to the longitudinal direction of the panel (1, 2).
- 20 36. Panel(s) according to any of claims 1 to 35, characterised in that a free space (30) is formed by the recess (3) between the bead (8) and the surfaces (31) of the recess (3), which join the tongue surface (7) and extend into the interior of the tongue (6).